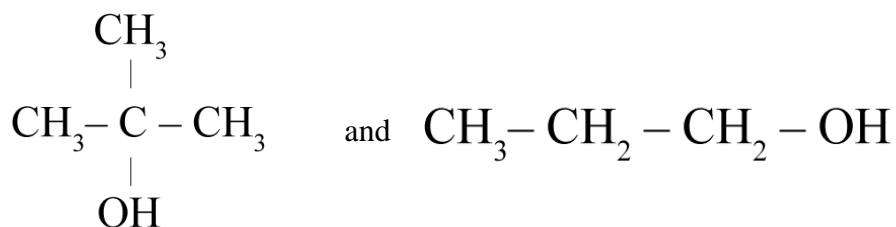


Level 3 Distinguishing between organic substances

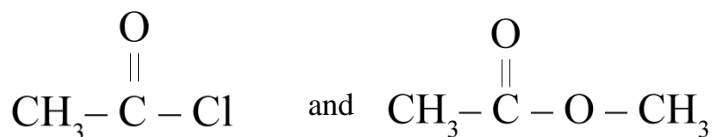
1) Explain a laboratory procedure that would allow the following pairs of compounds to be distinguished. In your answers, you should include:

- the reagent used
- the expected result for any reactions that may or may not occur
- the structural formulae of the organic product(s) formed when the reaction(s) occur.

i)

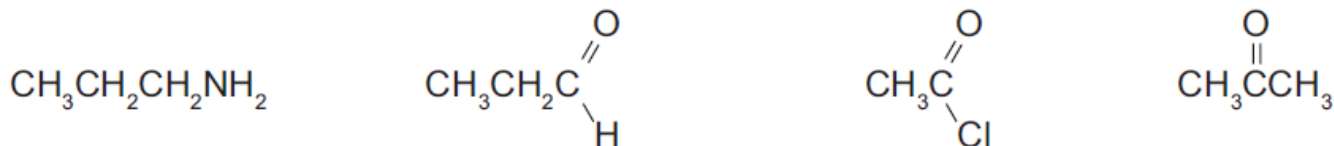


ii)

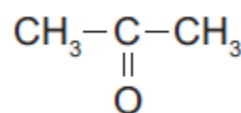
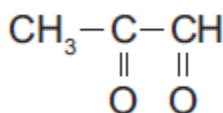


2) Explain a laboratory procedure that would allow the following pairs of compounds to be distinguished. In your answers, you should include:

- the reagent used
- the expected result for any reactions that may or may not occur
- the structural formulae of the organic product(s) formed when the reaction(s) occur.



3) Describe a test that could distinguish between an amide and an amine



4) Explain how you could distinguish

Your explanation should include:

- the reagents used and the conditions needed
- the expected observations.

from propanone

5) Compound **X**, an isomer of Compound **A**, C₃H₆O₃, can exist as enantiomers. It reacts with acidified dichromate solution to give Compound **Y**, C₃H₄O₃. Both compounds **X** and **Y** react with sodium carbonate to produce carbon dioxide gas. Identify Compounds **X** and **Y** and justify your answers in relation to the information above.

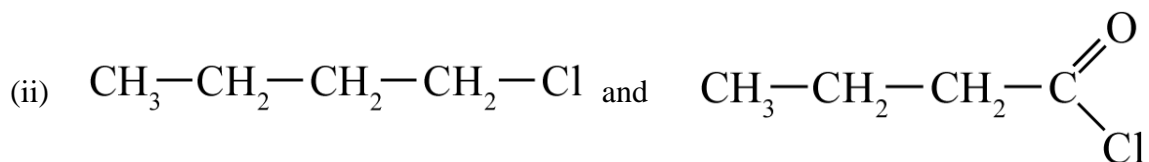
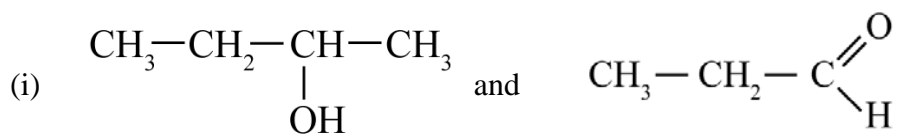
6) Devise a method for distinguishing between propanoyl chloride, 2-amino-3-methylbutane, pentanal, 4-chlorobutanoic acid. Each test should use either **moist red litmus paper** or an **acidified solution of potassium permanganate**.

7) Discuss how to test propanal and propanoic acid to demonstrate that they are different from each other AND different from propan-1-ol. Include the observations that would allow each substance to be identified as a result of these tests.

8) The identity of a colourless liquid is unknown. It is thought to be one of the following: ethanoyl chloride (CH₃COCl) or ethanol (CH₃CH₂OH) or 2-methyl propan-2-ol ((CH₃)₃COH) or hex-1-ene (CH₂=CHCH₂CH₂CH₂CH₃).

Devise a scheme using **bromine water** and **acidified dichromate** to identify the colourless liquid. Describe the observations expected at each stage (equations not required).

9) Describe a chemical test that would distinguish between each of the following pairs of substances. For each test, identify the **reagents** used, and link the **observations** to any reactions that may or may not occur.



10) Describe chemical tests that could be used to distinguish between the compounds in each of the pairs of substances below. For each test description:

- include reagents used, and
- link the observed results to the reactions occurring at the functional groups present in the organic molecules.

Do **NOT** use the same test more than once.

